3GPP TSG-RAN WG3 #117-e R3-225915

15 - 24 Aug 2022

Online

**Agenda Item: 11.4**

**Source: ZTE - Moderator**

**Title:** **Summary of Offline Discussion on CB: # QoE3\_others**

**Document for: Approval**

# **Introduction**

**CB: # QoE3\_Others**

**- Discuss the RAN visible QoE values from RAN3 perspective before triggering coordination with SA4?**

**- Discuss and clarify the benefit of event-triggers?**

**- Clarify the QoS flow information transmitted over Uu and F1.**

**- Whether OAM should send priorities to RAN for QoE reporting?**

**- Discuss and clarify the necessity of DU participation in RVQoE configuration and reporting.**

**- Capture agreements and open issues.**

**- Provide TPs if agreeable**

(ZTE - moderator)

Summary of offline disc [R3-225915](file:///C:\Users\00279251\Documents\3GPP\RAN3%23117-e\CBs\CB%20%2354\Inbox\R3-225915.zip)

Please Note:

There would be two rounds of email discussion.

The 1st round will be ended by 12th OCT, 08:00 UTC, Wednesday.

The 2nd round will be ended by 14th OCT, 23:59 UTC, Friday.

# **2 For the Chairman’s Notes**

Propose to capture the following:

# **3 Discussion (1st round)**

This part provides the first-round discussion on the R17 QoE left-over issues. The colored sentences after the title of each sub-session are copied from minutes of RAN3#117-e.

NOTE:

LS/TP(s) would be handled in the second round, if there is any consensus.

## RAN visible QoE values

RAN3 to further discuss whether RAN visible QoE value should be generated directly by UE App layer, and/or with other involvement, e.g., UE AS layer.

RAN3 to further discuss what RAN3 wants as a RAN visible QoE value, and the following aspects can be considered:

whether RAN visible QoE value is calculated by one or more RAN visible QoE metrics

whether RAN visible QoE value is similar or different from MOS value defined in TS 26.909

other alternatives to define the RAN visible QoE value.

According to the contribution on RVQoE values, there seems no common understanding on the purpose and benefit of introducing RVQoE values, which is supposed to be clarified first before we go deep into details. Different points from papers are briefly shown below:

In **[10]**, it is mentioned that RAN visible QoE value is used by RAN to perform radio resource optimization and can save Uu interface resource. **[11]** thinks RVQoE value is a generalized value which reflects the overall situation of UE experience in application layer and it can save the RRC signaling by reducing the information to be transmitted. **[3]** also thinks RVQoE values can be used by RAN for the purpose like resource optimization.

**[6]**’s understanding is that, the purpose of RAN visible QoE value is to indicate subjective experience of an ongoing service, like MOS value for audio, which could be useful for RAN to take further actions if RAN is aware of such value.

While, **[8]** provides the understanding that the RVQoE value is used to reduce the transmission latency, in order to meet the requirement for scheduling.

There should be a common understanding on the purpose and benefit of reporting RVQoE values, to improve the efficiency of our further discussion.

Based on the discussion from companies’ contributions, Moderator provides the following understanding on RVQoE value, which might lead to different implementations:

1. **RVQoE value should reflect the overall situation of the experience of an ongoing service.**
2. **RVQoE value is used by the RAN node for radio resource optimization, and can save on uplink RRC signaling, compared with transferring multiple QoE metrics (not only RAN visible QoE metrics).**
3. **RVQoE value is used to reduce the transmission latency, in order to meet the requirement for scheduling.**

**Q1：Please provide your opinions on the bullets listed above and also your own understanding on the purpose and benefit of reporting RVQoE values, if any.**

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Another key issue to be confirmed is the representation of RVQoE value. According to the descriptions in different papers, there are the following three options provided:

**Option A: an objective/qualitative number, e.g., a number which ranges on 0-10, poor/medium/good.** [2] [11]

**Option B: a simplified version of the RVQoE metric or QoE related event (e.g. stalling).** [8]

**Option C: a value or set of values when a QoE-event is fulfilled, for example** [4]**:**

*RVQoE value for event E1 = {buffer level, timestamp, number of video stalling events from the time of last RVQoE reporting}*

Among the three options above, both Option B and C touches the discussion on the event triggers for RVQoE values.

In **[2]**, it is mentioned that If the intention of RVQoE value is to save on uplink signaling overhead by not reporting the raw value of a RVQoE metric, RAN3 should discuss whether event triggers for RVQoE metrics or pre-defined thresholds (or mapping table) can be introduced.

**[6]** proposes that RAN3 should clarify the use cases of QoE value based on the AS events, if companies think QoE value should also consider the events at the AS layer.

Basically, the purpose and use of introducing trigger events for RVQoE value is unclear, considering there is not any trigger events defined for RVQoE till now. So, along with the representation of RVQoE value, whether it is necessary to define trigger events for RVQoE value can be clarified at the first round. The corresponding questions are organized as below:

**Q2: Which option above do you prefer, for the representation of RVQoE values?**

**Q2bis: Do you think any trigger events should be introduced to trigger the calculation/reporting of RVQoE value?**

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According to the discussion above, it is proposed to liaise SA4 (and/or other related WGs) on RAN3’s requirement and suggestions on RAN visible QoE values, where at least the following bullets should be mentioned:

1. **The purpose and benefit of reporting RVQoE values, if a common understanding can be reached in Q1.**
2. **The representation of RVQoE values, which depends on the conclusion of Q2.**
3. **Whether RVQoE value should be generated by single or multiple QoE metrics, TBD in 2nd round.**
4. **Which entity should generate the RVQoE values, TBD in 2nd round.**
5. **The suggestions on how to calculate RVQoE value from RAN3 perspective, TBD in 2nd round.**

**Q3: Please share your opinion on the bullets captured above about the candidate contents in the draft LS to SA4 and/or other WG(s).**

Please also list here if you think any other things should be added.

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## RVQoE Trigger Events

RAN3 to further discuss threshold-based triggers and event-based triggers for RAN visible QoE report, where the discussion should include but not limited to the clarification of the benefit of such triggers.

The threshold-based triggers and event-based triggers were discussed at last meeting but reached no consensus.

Among the contributions of this meeting, **[4]** propose to consider application layer buffer level threshold as the threshold-based trigger, and the event-based triggers such as handover, RAN overload, RRC state transition, video stalling.

**[2]** proposes that RAN3 should only consider RVQoE metric based event triggers at UE APP and not consider any radio-quality-based events at UE AS to avoid increasing UE complexity for the sake of small overhead improvements.

**[3]** prefer to define radio quality related event trigger and RV QoE metric value related event trigger.

**[9]** suggests discussing the events during handover to trigger the RVQoE collection.

**[6] [11]** do not think it of much necessity to specify trigger events for RVQoE reporting.

There seems on tentative consensus on the trigger events. Companies can provide more opinions on this topic.

**Q4: Please list below your preference of the triggers and clarify the benefit of them.**

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## QoS flow information for RVQoE

UE should include QoS flow information in the RVQoE report to RAN.

QoS flow information should be introduced as an explicit IE in the RAN visible QoE report over F1.

RAN3 to further discuss details on QoS flow information e.g., QoS flow ID, DRB ID, PDU session ID.

There was no final decision on what the ‘QoS flow information’ stands for in RVQoE report and over F1’; so, it was proposed to be clarified at this meeting.

Based on the papers submitted this time, the majority **[2][3][6][9][14]** hold the view that the QoS flow ID(s) should be included in the RVQoE report over Uu.

With regard to the F1 transmission of RVQoE report, the majority **[2][3][11][9][14]** think DRB ID(s) can be transferred over F1 for DU optimization, because the gNB-CU can map the PDU session ID and QoS flow ID into DRB ID. **[6]** thinks DRB ID or (PDU session ID + QoS flow ID) can be transferred over F1.

**[4]** proposes The DRB ID(s) used in the application session are included in the RVQoE report over Uu, and in the RVQoE report over F1; and the PDU Session ID as an explicit IE in the RVQoE report over F1.

Considering the majority’s view from the contributions, Moderator made a summary in the following two proposals:

**Proposal 1: QoS flow ID(s) should be included in the RAN visible QoE report collected at the UE.**

**Proposal 2: DRB ID(s) should be transmitted over F1 as the QoS flow information in the RVQoE report.**

**Q5: Do you agree with the two proposals above?**

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## Per-slice RVQoE

Some consideration on per-slice RVQoE are provided at this meeting.

**[3]** proposes that the slice ID information should be added as an explicit IE over Uu in RVQoE configuration and report for per-slice RV QoE collection and optimization, another alternative pf which is to Add the PDU session ID information as an explicit IE over Uu in RVQoE configuration. **[4]** also showed preference to support per-slice RVQoE.

**[10]** proposes not supporting per-slice RVQoE, with the argument that currently the size of slice configuration is bigger than that of RAN visible QoE Report —— introducing per-slice RAN visible QoE cannot save Uu interface resource.

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**Q6: Do you think per-slice RVQoE should be supported?**

## DU participation in RVQoE

Further discuss whether the DU can activate/deactivate receiving the RAN visible QoE reports? Whether the DU can participate in assembling of RAN visible QoE configuration.

**[4]** brought more discussion on the DU participation in RVQoE this meeting, with the key point that DU is the consumer of RVQoE report but has no say in whether it is interested in receiving RVQoE report, neither in setting the RVQoE measurement configuration. So, it proposes that a DU can activate and deactivate the reporting of RVQoE metrics from CU to DU; and that a CU can notify a DU when RVQoE metrics are available, and the DU can suggest to the CU the parameters to be used in the RVQoE configuration, or indicate that it is not interested in RVQoE measurements for the UE.

**[6]** deem it not needed to introduce the (de)activation of RAN visible QoE report in F1. DU does not need to provide the RAN visible QoE configuration suggestion.

**[10]** think it not worth introducing an initiating procedure because of only two RVQoE metrics at current time.

**Q7: Do you think it is necessary to support the DU participation in activation/deactivation of receiving the RAN visible QoE report, and/or the assembling of RAN visible QoE configuration?**

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## Overload handling enhancement

Further discuss whether OAM can send the priorities to NG-RAN for legacy QoE report.

**[10]** and **[14]** hold the view that OAM should send the priorities for QoE reporting in QMC configuration, and RAN should send the priorities to UE.

**[6]** agrees that OAM should send the priorities to RAN but thinks there is no need to send the priorities to the UE.

**[1]** proposes the OAM should not provide priorities to the RAN concerning QoE reporting or RVQoE reporting.

Aside from the detailed opinion on the prioritize mechanism mentioned above, **[5]** proposes that Rel-18 QoE work to consider a need for enhanced network management strategy in case of pausing of different QoE measurements configurations.

**Q8: Do you think OAM should inform RAN about the priorities of QoE measurements for QoE reporting, and what about from RAN to UE? For the consideration in [5], pls also list below if you have any comments.**

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## Others

**Focus on the left issues approved in R18 WID**

There are some issues which are not included in the WID and NOT preferred to be discussed according to the chairmen notes:

* Support the alignment of s-based QoE and m-based MDT [1].
* Introduce the MCE URI IE in the UE Application Layer Measurement Configuration Information IE on NGAP and XnAP [1].
* RAN3 agree to use SHR as baseline for RVQoE reporting during mobility [9].

Please also add here if you think any main points in your paper was missed in the SoD.

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# **4 Conclusion, Recommendations**

See section 2.

# **5 References**

1. R3-225334 Enhancements of Rel-17 QMC (Ericsson) discussion
2. R3-225414 Enhancements to RAN visible QoE (Qualcomm Incorporated) discussion
3. R3-225432 Discussion on QoE enhancement of R17 left-over features (Samsung) discussion
4. R3-225559 Enhancements of RAN Visible QoE Measurements and Reporting (Ericsson) discussion
5. R3-225591 QMC enhancements for RAN overload (Nokia, Nokia Shanghai Bell) discussion
6. R3-225689 Further discussion on the support of R17 left-over features (Huawei) discussion
7. R3-225690 [DRAFT] LS on RAN visible QoE value (Huawei) LS out To: SA4 CC: RAN2
8. R3-225748 Discussion on RVQoE value (Xiaomi) discussion
9. R3-225749 Discussion on RVQoE Reporting (Xiaomi) discussion
10. R3-225767 Discussion on Left-over issues (CATT) discussion
11. R3-225822 Discussion on R17 QoE left issues (ZTE, China Telecom, China Unicom) discussion
12. R3-225823 TP to BL CR of 38.473 on RAN visible QoE (ZTE, China Telecom, China Unicom) other
13. R3-225824 TP to BL CR of 38.401 on RAN visible QoE (ZTE, China Telecom, China Unicom) other
14. R3-225840 Further discussion on R17 leftover issues (China Unicom) discussion